

Power of dark matter: The Milky Way is warped

Source: <http://sci.tech-archive.net/Archive/sci.energy/2006-01/msg00149.html>

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 - *Date:* Wed, 11 Jan 2006 05:17:24 GMT
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WASHINGTON (Reuters) — The Milky Way is warped — like a bowl, a saddle or the brim of a fedora hat, depending on when you look — and a pair of interlocking galaxies may be to blame, astronomers said on Monday.

Earth is in a fairly non-warped neighborhood, because it lies relatively close to the center of the Milky Way's disk, said Leo Blitz of the University of California, Berkeley.

But the far-flung reaches of the galaxy could be caught up in a warp of as much as 20,000 light-years. A light-year is about 6 trillion miles, the distance light travels in a year and a standard astronomical measurement.

To figure out what causes the warp, Blitz and his colleagues analyzed hydrogen gas emissions in the warp area, and found that not only is the galactic disk bending, but it is vibrating like a drum-head, in three distinct ways.

One mode is like a bowl, with the galactic plane bending up all around; another is like a saddle, and the third is like the brim of a fedora hat, bent up in the back and down in the front, Blitz said at a briefing.

The various modes of warping correlate closely with the orbit of two satellite galaxies, known as the Large and Small Magellanic Clouds, that make a looping orbit around the Milky Way. As they go, they plow through a halo of dark matter that encircles the Milky Way, scientists said at a meeting of the American Astronomical Society.

Dark matter is invisible, but it is definitely something to be reckoned with, since it makes up 90 percent of all matter in the universe. Normal matter, which is everything we can see and feel, makes up the rest.

Why is it warped?

Scientists have known about the Milky Way's warped nature for half a century, but they never knew the cause. The Magellanic Clouds were previously dismissed as suspects because they lacked the mass to influence our galaxy in their 1.5 billion year trip around it.

While the Magellanic Clouds' mass is small, they pass through the dark matter like ships going through an ocean, creating a cosmic wake powerful

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enough to make our galaxy bend and flap, Blitz said.

This model could also explain the warps in other galaxies. "The warping is very, very common," he said.

Besides being warped, the Milky Way turns out to be voracious, pulling in a galaxy that was detected with the Sloan Digital Sky Survey, which studies huge swaths of sky.

Robert Lufton of Princeton University, whose team discovered the big, dim feature, called it a "large pathetic galaxy" with a mass comparable to a cluster of stars, much less than the Milky Way.

One such star cluster that had been pinpointed as the source of mysterious blasts of X-rays and gamma rays was found to contain a bumper crop of big stars known as red supergiants, said Don Figer of the Space Telescope Science Institute.

Red supergiants are big old stars that bloat up to 100 times their normal size before exploding as supernovae, and Figer said the X-ray and gamma ray blasts were released in supernova explosions.

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